THE Chemist

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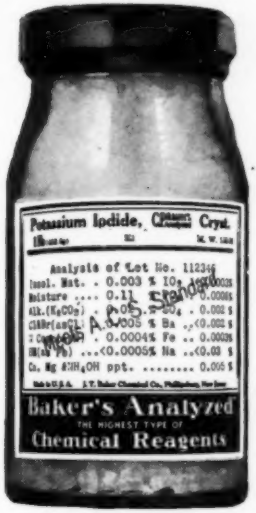

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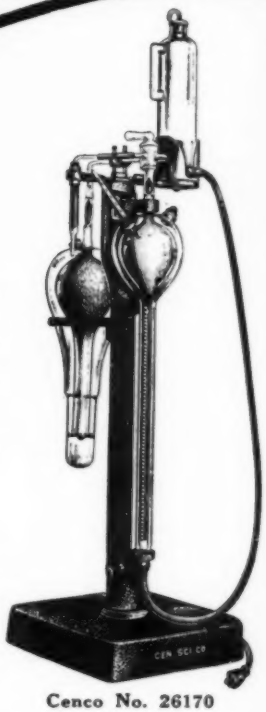

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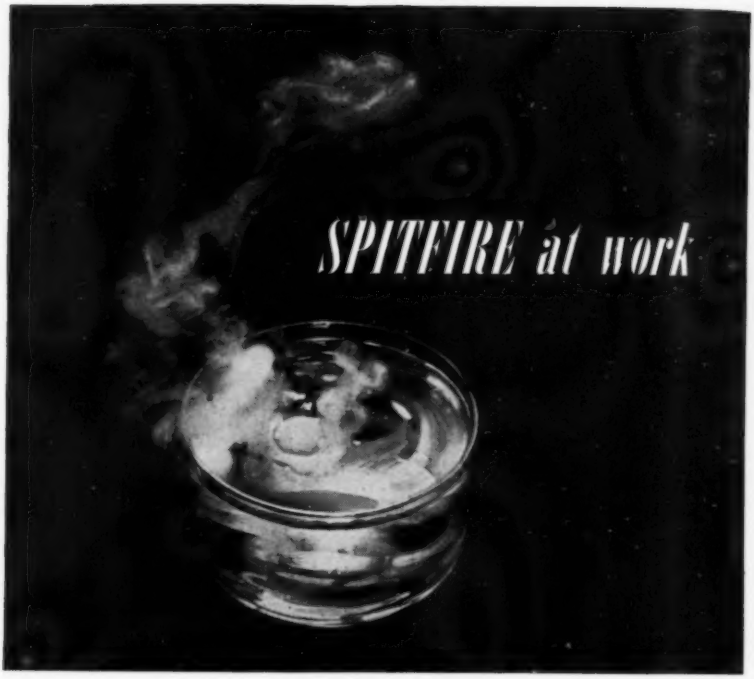

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If I Could Renew My Education

A number of Fellows of the A.I.C. were asked what subjects they would take in college if they could go to school again, and what subjects they would recommend to present-day students. The replies are interesting. Comments by other members of the A.I.C. will be welcome.

IF I could renew my education, it would be my great desire to come directly under the personal observation and influence of a truly inspiring professor. That is most important not only in the technical training of a young chemist, but also in the formulation of his whole attitude towards his career. I was most fortunate in working under such a man. It is to be hoped that the colleges may be able to give reasonable financial encouragement to the teachers, who have been up to now the forgotten man of the chemical field.

The field has broadened so much that it now takes much longer to acquire a good grasp of the fundamentals than it did in my college days at the turn of the century. Hence, I would not want to begin specializing too early in one branch of chemistry, and I would not be too anxious to get through in four years. When I did specialize, it would be in some phase of organic chemistry.

I would like to study again, as I did at Buchtel College (now the Univeristy of Akron), under a plan which sent me out for practical observation into the nearby factories which used chemical processes.

In addition to my chemistry courses, I would want to take some work in business methods, which would help me after I make a start in industry. I would also like to take courses in composition, even at the expense of work in literature, for a chemist needs to be able to write clear and interesting reports.

—Dr. John W. Thomas, Honorary Chairman,
The Firestone Tire and Rubber Company, Akron, Ohio

THE field of chemistry is so comprehensive that every chemist eventually specializes, either through accident or design, or force of circumstances. The resultant "specialist" naturally finds that some of his college courses were of greater value to him than others, but that none of his chemical courses was entirely useless. Biochemistry may have little practical value for a man who winds up in ferrous metallurgy; high-polymer chemistry may have but little practical application for the chemist whose duties are entirely in the field

of compounding cosmetics. Too few undergraduates can be sure of the precise field in which they will eventually find themselves.

The object of undergraduate training in chemistry must therefore be to turn out men with a smattering of knowledge in all of the recognized subdivisions of chemistry. Our graduates in chemistry should not be called chemists—the best we can expect is sufficient basic knowledge to start them off in the practical world of chemistry.

However, there is one course I would like to see added for all undergraduates who are studying chemistry, a lecture and demonstration course in "Commercial Materials—the Tools of Industrial Chemistry." Our present courses deal primarily with pure substances, with specific elements or compounds, while a large proportion of us work in practice with materials of natural and varying origin and quality, or with commercial grades of materials that are far from pure. Is benzol just C_6H_6? Not commercial benzol. Are all grades of cottonseed oil alike? What is animal glue and how many kinds are there? What are the industrial properties, common grades and uses of the natural gums, waxes, fats, oils, bitumens, crude petroleums, coal tars, naval stores, starches, shellac, botanicals, essential oils, casein, rubber, albumens, metals and alloys, ETC.?

Two or three hours a week for one year would provide a course of real practical value, one which I am sure would be highly popular with students and which would be bound to turn them out into industry in a condition not quite so "green".

—Edgar S. Genstein, President
Kem Products Company
Newark, N. J.

IF I were beginning my formal education in chemistry, I should follow pretty much the same basic program as I did forty years ago. Briefly, this involved a broad education as an undergraduate with major emphasis on chemistry together with the basic principles of physics and mathematics; followed by graduate training sufficient to get a Doctor's degree. As part of my basic training in chemistry, I should want a course in colloid chemistry, which was not available in my day. A course in written English should by all means be included in the program as well as training in the principles of economics. Some knowledge of world history is also very desirable and at least some contact with music, fine arts, and literature. A course in reading Russian is today fully as important as a course in reading German.

It is fully realized that in some instances economic conditions are such as to preclude graduate training, but this should be provided for, if at all possible.

Some of the more progressive colleges are offering courses in personal relations, and the experience gained from such training should prove invaluable in either academic or industrial surroundings.

In brief, the basic outline of the educational program would be as an undergraduate, specializing in chemistry, including physics and mathematics, but spending about forty per cent of the time on courses in written English, economics, world history, and the fine arts, together with sufficient training in languages to permit reading both German and Russian.

—Dr. Gustavus J. Esselen, Pres.
Esselen Research Corporation
Boston, Massachusetts

CHEMICAL education in the Polytechnical School of Vienna, from which I was graduated, was built on a solid foundation. Durthe first two years, the greater part of our time was not devoted to chemistry at all, but to physics, mathematics, economics, and the like, chemistry being represented only by a historical survey, going back to the days of the Egyptians. There was one exception, however, the laboratory. We had a compulsory course of qualitative and quantitative analysis, which took up twenty hours per week during these two years.

I would not change any of this broad educational program today, if I could, except the laboratory, which I would cut out almost completely, including such auxiliaries as beaker washing and glass-blowing. I believe that analytical chemistry should be delegated entirely to specialists (and technicians), with the average chemist just studying enough of it to know its mechanics and judge its results. To think of all the subjects one could have mastered while learning how to prepare a tenth-normal solution, or to precipitate and filter barium sulphate!

Today, with chemistry covering a much wider field than when I was a student, I would consider analytical and glass-blowing activities almost a waste of time.

—Dr. Otto Eisenschiml, President
Scientific Oil Compounding Company
Chicago, Ill.

I HAVE used all the courses which I had at college, including a thermodynamics course which I elected from the Engineering College, and as a chemical engineer, it was considered most unlikely at the time that I would use it. There are many other courses which I would have selected but I did not have time to include them in four years.

—S. J. Cohen, President
Hardesty Chemical Co., Inc.
New York, N. Y.

WERE I to go back to college, there is much that I would eliminate but considerably more that I would add. In general, time spent in learning the intricate derivations of laws and formulae in thermodynamics, alternating currents, etc., was largely wasted. The course was designed to turn out chemical engineers. Even so, too much time was spent on peripheral subjects. For this purpose everything except chemistry, physics, and closely related engineering subjects could have been omitted. Such a course might equip one to make a living but would not necessarily make a well-rounded citizen, who is also a chemical engineer, with the capacity to become an educated leader in our democratic society, nor with the means for satisfactory living with himself and his fellow-men.

I regret that my course did not include some subjects like geology, botany, anthropology, civics, etc., which, in addition to chemistry and physics, are necessary for even an elementary understanding of the world in which we live and the people and things in it. I would want a good course in the history of chemistry and science, and in general history, more particularly the history of the cultural development of the human race. I would want more emphasis placed on the art of thinking, on weighing and evaluating propositions, on open-mindedness and objectivity, and less on the acquisition of "facts". Four years is not enough for such a course. Six years would be better.

In his "House Divided" speech, Lincoln said: "If we could first know where we are, and whither we are tending, we could better judge what to do, and how to do it". Essentially, this is the way all technical matters are attacked. It would be well if our chemistry and chemical engineering courses could equip graduates to approach all questions in this manner.

—B. E. Schaar, President
Schaar and Company
Chicago, Ill.

I HAVE been asked, "If you could go back to college again would you take the same courses today that you took when you were a student?" After thoughtful consideration of twenty-five years in the profession, I do not hesitate to answer in the affirmative. I feel that the curriculum of my first two years gave me the rounded background of a general education, and in the following two years, the curriculum provided for my vocational objectives.

As to the question, "Are there other courses which you wish you had taken?" my answer is also in the affirmative. The two courses that I wish I had taken, both of which would have made my task easier are "Methods in Writing Reports" and "Public Speaking". There is a preponderance of evidence in the pro-

fession of a lack in understanding of the proper methods in the forming of a report. Also there are so many among us who lack the necessary confidence when called upon to address a group, which is deplorable, particularly since this quality could have been easily attained by having taken a course in public speaking.

Therefore, I recommend these two courses to all students with the wish that they be made a requirement for all candidates for a science degree.

—*Maurice Siegel, Partner*
Strasburger & Siegel
Baltimore, Maryland

IN contributing to this subject, the attitude of the writer will be based upon whether he is doing a type of work which involves the application of most of the subjects studied by him when he was in the university. If a graduate is conducting a type of service to which the subjects he has studied apply, he feels gratified that the subjects he studied find such ready application. On the other hand, if an individual is not successful in procuring a position, he experiences some disappointment; and if he is conducting a type of work foreign to the courses taken, he would as a result wish that he had taken up other subjects which would better fit him for his work.

From my own angle, I would probably take the same courses that I studied in the university. I started out as a mechanical engineer, then took electrical engineering, and after four years in industry returned to complete all of the undergraduate courses in chemistry to qualify me as a chemical engineer, or rather these varied branches of engineering which now classify one as an "Industrial Engineer."

Undoubtedly, every graduate takes many courses, the subject matter of which is of little value to him. However, all such courses contribute toward the cultural and training value of his college work. All of us wish that we had taken certain other courses. The more ambitious of our graduates invariably study such courses or subject matter by themselves, independently.

The courses which would be of most value to the student chemist today are the fundamental subjects in chemistry given in most of our first class educational institutions, plus subjects directly applicable in qualifying the chemist to do such work as he would be confident that he would be called upon to perform, based upon a position of which he would be assured before leaving the university. One is hardly justified in concluding that I am of the opinion that our present curriculum in chemistry is perfect. However, I believe it to be a close approximation in providing our students of chemistry with a moderately good academic training, supplemented by the basic

or fundamental courses in chemistry. To a student who has achieved the objectives of such a course, he should above all else learn how to study, and with this accomplishment, he should be able to provide himself with subsequent information to qualify him in certain fields of specialities to which he has directed his efforts.

—H. A. Levey, Consulting Chemist and Industrial Engineer
New Orleans, La.

WHAT I wanted my education to be has troubled me for many years. Whatever the training given me was intended for, remains a mystery. It had no integrated purpose nor any particular objective in my day.

I have chosen chemical engineering as the course which I have planned here for its greatest value to me. I would want every fact and formula presented as a tool for future use in all of its applications. Mere generalized presentation of theory along with some descriptive reading would not be enough. The course would be centered around the fundamental science and engineering subjects, but threaded through the four years would be cultural subjects, such as history and government, ethics, law, and philosophy, languages and literature. The teachers should be free to evaluate these subjects for me; should teach me to evaluate them for myself, so that I would know how to progress as a leader, not only in my chosen field, but as a citizen in my community, my state, and in the nation. I would want these teachers to orient me and to correlate my field of study in our social and economic system. They should teach me how to recognize the trend of events in my special field of study.

The courses should include information about what constitutes professional status, and how the individual may earn his living without necessarily depending upon a salaried job as a means of income. I would want to be informed on many aspects of my field, such as how to contract all or part of my services to one or more people, as lawyers and doctors are trained to do. The man in trouble seeks the lawyer; the sick man seeks the doctor, but how does the scientist go about it to get people who need him to seek his services? At what rate must he sell his service? What are the ethics of his profession?

This course in chemical engineering should be so set up that it will turn out a professional chemical engineer, who if he desires, and after a period of interneship or a few years of experience, may set himself up as a consultant or as a member of a firm of engineers. The present day technical training only prepares men to work for a salary and the professional side of their activities is omitted entirely.

Obviously all men cannot be trained with assurance of top positions, but few are helped to reach them by the present courses given in the sciences. The student must attain his own goal after his school days, but he will attain it more easily, if his course of training has set him in the right direction.

—E. R. Harrouff
Kansas City, Missouri

I WOULD not want to take exactly the same courses today as were required when I was a student in the period 1908-1912. Many of the courses then given would be essential today but would undoubtedly be very much more comprehensive and better selected.

There were courses which proved of little value and represented largely recitals of factual data that could have been obtained by reference work to better advantage. Other courses could advantageously have been substituted which would have amplified more intensive study of fundamentals and with greater opportunity for original thinking.

It is my considered opinion, that I would make the following recommendations: (1) Greater stress on the study of physical chemistry, both theoretical and applied; (2) Greater stress on advanced physics, particularly nuclear physics; (3) Electronics; (4) More advanced mathematics instruction, beyond calculus; (5) A well-selected course or courses in the properties of materials, including in this respect metallurgical studies of materials and physical testing.

In recent years in chemical instruction, there appears to have developed a tendency to decrease time and study given to analytical chemistry. From observation, over some years, of recent graduates, I believe that greater emphasis should be put on analytical chemistry, perhaps not to the extent required at the time of my instruction, but certainly to a considerably greater degree than appears to be the recent trend in such instruction.

—P. E. Landolt, Chemical Engineer
New York, N. Y.

Fritzsche Brothers, Inc., 76 9th Avenue, New York 11, N. Y., in commemoration of the seventy-fifth anniversary of the founding of the company, have established an annual award for scientific achievement in the field of essential oils and aromatic chemistry. The award consists of a gold medal and $500 in cash, to be given to the person who contributes new or improved methods of analysis to the testing of essential oils or aromatic chemicals.

Heyden Chemical Corporation announces plans to construct a $450,000 fine chemicals building as an addition to its plant.

Ballot on Proposed Coalition

On January 21st, the ballot on the proposed coalition between the A.I.C. and the A.C.S. stood as follows:

For	1007
Opposed	150
No vote	7

Many comments, both for and against the coalition, were received. Every comment was mimeographed and mailed to the National Officers and Councilors for their consideration. Dr. Snell will answer, personally, each signed comment.

Edison Commemoration

The 100th anniversary of the birth of Thomas A. Edison will be commemorated by the New York Section of the American Institute of Electrical Engineers and associated organizations at a banquet to be held in the Waldorf-Astoria, New York, N. Y., February 11th.

Hermann Enters Consulting Field

Dr. Seymour M. Hermann, F.A.I.C., president and director of the Apex Chemical Company, Inc., announces that he has terminated his connections with that firm as of July 1, 1946. He is offering his services as a consultant in the textile, leather, paper, and allied chemical specialty fields, at the laboratories of the American Organic Chemical Corporation, 1300 Allen Street, Linden, N. J., where he maintains research facilities. His son, Stanford L. Hermann, F.A.I.C., vice president and director of Apex, has also resigned from that Company.

Esselen Research Corporation

On November first, the firm name of Gustavus J. Esselen, Inc., was changed to Esselen Research Corporation. Dr. Gustavus J. Esselen, F.A.I.C., continues as its president and active head, with Dr. John G. Hildebrand, Jr., serving as vice president, and Martin H. Gurley, Jr., as chief of the Textile and Paper Section. No change was made in the management, personnel, or policies of the firm, but the new corporate title was felt to be necessary as more descriptive of the expanded scope of the business. Offices and laboratories are at 857 Boylston Street, Boston, Massachusetts.

Dow Chemical Company announces that war veterans returning to the company will receive $10.00 for each month of service, up to a maximum of $100.00. Hourly-rated workers also receive increases of 14 cents, with portal-to-portal pay retroactive to 1940.

The University Training Command at Florence

L. F. Audrieth

The University of Illinois

CONSIDERABLE publicity has been given to the universities which were established under Army auspices in the European Theater of Operations at Biarritz and Shrivenham. Less is known about the first of these schools established in the Mediterranean Theater of Operations at Florence, Italy. What has been written concerning these Army universities applies also to the G.I. college in Italy and to others which were subsequently established in the Pacific.

These institutions were founded to fulfill a definite need. The military high command in each of the theaters of operations was concerned with the disposal of manpower once victory had been acheived. It was impossible to send military personnel back immediately, since the necessary shipping space was not available to undertake their redeployment. It was inadvisable for political reasons to remove all personnel from combat and occupied zones immediately after cessation of hostilities. Obviously, something had to be done to occupy the time and efforts of large bodies of troops to keep morale from deteriorating.

Such an intermediate period might, therefore, be used effectively in facilitating the transition from military routine to civilian life. An accelerated Army educational program was considered to be the logical solution, especially since so many of the men and women in the armed forces had been forced to interrupt their schooling because of the war. Many of the G.I.'s, by the very nature of military command and discipline, had come to rely heavily for guidance in their daily activities upon the noncommissioned and commissioned officers in whose charge they had been placed. It was quite necessary to give the soldier a chance to grade slowly back into a civilian routine of life and to give him an opportunity to begin again to think for himself. For those men who had had some college training but who had not for several years given thought or attention to much else beyond the necessity of survival in this most brutal of all conflicts, it meant an opportunity to adapt themselves again

to their old ways of thinking, old interests, and study habits.

Plans for the establishment of these army universities were originated by the Information and Education Division of the War Department early in 1943. In November, 1944, the first members of the educational information staff were detailed from Washington to initiate plans for a university in the Mediterranean Theater of Operations (MTO). By January 1945, additional officers, all trained in the School for Personnel Service in the United States, had been sent to Italy to assist in the preparation and organization of a college educational program. Fortunately, Florence was chosen as the educational site, because the necessary physical facilities were available, and because the cultural air of this historically and artistically important city was ideally suited for the location of an educational institution.

The University Study Center was activated under a separate command known as the University Training Command. Seven modern buildings specifically designed for educational purposes, comprising the former Fascist School of Applied Aeronautics, were requisitioned. Arrangements were also made with the authorities of the University of Florence for use of the scientific facilities of that institution, including the laboratories of chemistry, geology, mineralogy, physics, astronomy, biology, bacteriology, and anatomy. Twelve departments were set up, one of which, the physical science department, was responsible for instruction in chemistry, physics, astronomy, geology, and mineralogy.

The school started operations as of July 2, 1945. Classes began a week later, when over 1300 students officially registered, of whom about ten per cent were officers. Approximately 8000 students attended the four sessions of the University Study Center.

The matter of qualified instructors was naturally a very important one. Unlike the sister institutions in France and England, the instructional staff had to be drawn largely from army personnel. It was later supplemented by civilians sent from the United States. The physical science staff consisted of twenty-two men, of whom three were civilians. Ten of these instructors, all drawn from the military, were active in the field of chemistry.

The whole Mediterranean Theater of Operations was combed for qualified personnel, and the army is to be complimented on the choice of individuals for this very important assignment. Despite the fact that most of these men had had no contact with university work for several years, they accomplished an outstanding job in organizing and presenting the course work in chemistry. The writer was not assigned to the

University Training Command until a month after the institution had opened. When he arrived, the program had already been well organized and developed under the capable leadership of Captain Ulysses S. Jones, FA. who was then serving as administrative head of the department of physical sciences. Captain Jones had already seen almost three years of active service in the Mediterranean Theater; upon his re-deployment to the United States, the writer took over the responsibilites for continuing the activities in science instruction.

Courses were offered in general, qualitative, organic, and physical chemistry, and also in organic preparations. Since each session lasted only four weeks, it was obviously impossible to give the equivalent of a whole semester's work in the short time available. Few students remained at the institution for more than one session. Emphasis was therefore, placed upon review courses, rather than upon those which offered the equivalent of college credit.

While military courtesies were required of anyone in uniform, formation and military exercises were reduced to an absolute minimum. Most students considered it a privilege and an opportunity to attend one of the sessions at the University Study Center. Every effort was made to place the student into a typical American college atmosphere. Student activities, such as sports, a school paper, lectures, and student organizations were set up at U.T.C. But even if these collegiate activities had not been offered, the cultural opportunities offered by the city of Florence would have more than compensated for their lack.

In Florence, Leonardo daVinci, Michael Angelo, Cellini, Botticelli, Donatello, Fra Angelico, and many of the world's famous painters and sculptors have been active. It was here that Dante and Machiavelli and Boccaccio lived and were inspired to produce their masterpieces of literature. Florence was the home of the famous navigator, Amerigo Vespucci, after whom America was named. The world famous historical landmarks such as the Pallazzo Vecchio and the Ponte Vecchio; the monastary at Fiesole where pre-Roman Etruscan artifacts have been brought to light; the Villa Palmieri, where Boccaccio wrote the "DeCameron"; the many churches such as the Duomo; the libraries and the museums—it was in the midst of such a wealth of history of tradition, creative art, and even of beauty that the student at the Italian G. I. University lived and learned. It is doubtful if any other Army University enjoyed a more stimulating environment.

The science student was particularly fortunate. The laboratories of the University of Florence were more than adequate, even though some-

what short on equipment. Physics was taught in the laboratory where Fermi had carried out his original experiments on nuclear physics. Chemistry courses were presented at the Istituto Chimica. This laboratory was founded by Luigi Schiff, known to all organic chemists as one of the outstanding nitrogen chemists of the 19th century. The tradition of research in nitrogen chemistry had been continued by his successors, Angeli and Pellizzari. Rolla had been active at Florence. An effort was being made by the present staff under Canneri, the director of the institute, to carry on the fine tradition of research for which the Florence laboratory has built up a reputation. Obviously, their work was handicapped by the lack of chemicals and equipment. Fortunately, these materials could be requisitioned from the medical department of the Army, and they were more than sufficient to stock the laboratories.

Astronomy could hardly have been taught in a more inspiring and appropriate place, for it was here that Galileo, the inventor of the telescope and the father of modern astronomy, did his outstanding work. A pilgrimage to the Galileo Observatory and to the Westminister Abbey of Italy, the church of Santa Crocce where Galileo is buried, would have suggested themselves to anyone interested in the sciences. The national museum of sciences, located at Florence, contains some of the original apparatus built by Toricelli, daVinci, and Galileo.

The student in geology had more than ample opportunity to study natural phenomena at first hand. Trips were arranged to such localities as the Carrarra marble quarries, the mercury mines at Monte Amiato, the travertine quarries near Rome, Vesuvius, and the geological and chemical wonder of the world at Larderello where the soffioni (natural steam vents) are harnessed for the generation of power and where both ammonia and boric acid are recovered as valuable by-products. An interesting special course also was offered to a limited number of students to give them an opportunity to study the technological aspects of Florentine art. Visits were made to ceramic and tile factories. The production of mosaics was observed. Casting of bronzes and the actual mechanics of sculpturing were also observed at the world famous School of Fine Arts of the University of Florence. These were the exceptional opportunities of a lifetime which could be enjoyed by the war-weary, homesick G.I. at the University Training Command. It was not as good as being home, but far better than anything which he had experienced in all Europe.

The school closed its doors on November 17, 1945. It more than fulfilled the mission for which it was established. Credit must be giv-

en to the I. and E. Division of the War Department for the foresight, as well as the initiative of the army authorities in bringing out the establishment of this institution. Much credit is also due to the regular army officers, in particular the commanding officers of the University Training Command, General Foster J. Tate and Colonel John W. Harmoney, for the sympathy which they exhibited with the aims and objectives of this educational program. Special credit is also due those young men who were drawn directly from combat duty to serve as instructors. All of them discharged their duties with real credit to themselves and to the armed forces. The writer takes pride and pleasure in acknowledging his personal appreciation for the excellent services rendered by the following, with whom he shared the responsibilities for instruction in chemistry: U. S. Jones, H. E. Calbert, J. P. Ecri, K. W. Glace, J. P. Larocca, W. S. Morton, R. B. Power, J. Saldick, N. A. Terhune, and I. Zipkin.

There is no question but that the military personnel who attended the University Study Center were able to return to civilian life better for their training and experience at Florence, and more qualified to resume again their normal peacetime activities.

Rubber Program Recommended

Dr. Ray P. Dinsmore, F.A.I.C., vice president in charge of research and development of the Goodyear Tire and Rubber Company, speaking before the American Institute of Chemical Engineers, in Charleston, West Virginia, November 21st, urged that Congress adopt an integrated rubber program to save the American synthetic rubber industry. "It is evident that with our natural rubber demand (980,000 tons) about equal to the total world production (900,000 to 1,000,000 tons), our natural rubber consumption can only be about 60 to 70 per cent of our total." Unrestrained competitive bidding for natural rubber, coupled with unwise advertising regarding the relative merits of natural and synthetic rubber, may wreck the synthetic rubber industry. He recommended, continued government purchase of natural rubber and a plan to assure the use of a minimum amount of synthetic by-product specification.

The aluminum extrusion mills at Cressona, Pennsylvania, have been purchased by the Aluminum Company of America from the War Assets Administration for $6,500,000.

Wyandotte Chemicals Corporation has announced a twenty-five million dollar expansion program.

A. I. C. Medalist 1947

Dr. M. L. Crossley, F.A.I.C., director of research, American Cyanamid Company, with headquarters at the Calco Chemical Division, Bound Brook, N. J., was unanimously selected to receive the 1947 gold medal of THE INSTITUTE, in recognition of his scientific work and leadership in research and of his activities in behalf of the profession of chemist.

Dr. Crossley has had a leading part in research on the relation of molecular structure to color in organic compounds; in the synthesis of dyes; in the discovery and industrial development of the sulfa-drugs, and in a fundamental study of the chemistry of infectious diseases, especially the changes in certain constituents of the blood in pneumonia and in the chemotherapy of cancer.

He has also been active in education fields. For many years, he has been a member of the Board of Directors of the Union Junior College and is at present the president of the Associated Alumni of Brown University. He received the Brown University Alumni "Brown Bear" award in 1940. He has taken an active part in scientific societies at home and abroad.

He is active in the professional societies. He was twice elected to the presidency of The American Institute of Chemists and was chairman of its Committee on Professional Education 1932. Further details concerning Dr. Crossley's professional activities will appear in the March issue of THE CHEMIST.

Rutgers University, New Brunswick, New Jersey, announces that for the first time in over five years it is graduating a normal number of students in the Spring of 1947. Three-hundred and sixty-three men, a large portion of whom are veterans, will receive their degrees at that time. Among these are twenty-five in the Biological Science Department, thirteen in Chemistry, six in Mathematics and Natural Science, and one in Physics.

Should the Supply of Chemists Be Regulated?

A Symposium Held by the Chicago Chapter, A.I.C., December Thirteenth.

Modulation Desirable

Dr. Johan Bjorksten
Bjorksten Laboratories

Lest there be any misunderstanding, I want to state at the outset that good chemists promote the expansion of our opportunities and that there can never be too many good chemists.

However, along the lower fringe of our profession, there are routine men, qualified as chemists, perhaps,, but without creative ability or even interest. In good times, these men fill a function. In hard times, they are the first to be unemployed. The general standing and compensation of the chemist are damaged in times of recession by the existence of any sizeable group of unemployed chemists.

It stands to reason that the chemist will benefit financially from the reduction of the pool of unemployed, qualified chemists, available in times of recession. The law of supply and demand applies to chemists as to everything.

Therefore, our profession will benefit from judicious *mod lation* of the supply of chemists. This will be accomplished, for example, if the entrance requirements to the profession, both on the college level and in licensing, are sharpened whenever influx to the profession exceeds the obvious needs. This would not hamper the outstanding men, but it would modulate, in a common sense manner, the size of the less capable and qualified fraction of the profession.

Regulation Impractical

Dr. M. T. Carpenter
Standard Oil Company (Indiana)

The fundamental issues seem to be two; First, is it desirable to regulate the supply of chemists; and, second, is it feasible? To me the whole proposition seems so impractical that any discussion of its desirability is almost wholly academic.

Unlike the professions of law and medicine, chemistry is not taught in specialized schools which give degrees clearly labeling a man a chemist. Practically every liberal arts college in the United States gives a number of chemistry courses. Graduates have

the right to call themselves chemists. Even if at some future time there should be a system of licensing, it would be by states. While states can perhaps decide how many physicians and lawyers they need per capita, neither the states nor anyone in them can decide how many chemists they need. Highly industrialized states need more chemists per capita than other states.

Regulating anything means that someone has to do the regulating. What would the criterion be? How shall the restriction be accomplished? We have seen many attempts at regulation during recent years, and all have had their troubles; but few of the programs attempted were faced with problems of the magnitude outlined here.

While I feel that these practical considerations completely rule out any restriction program, we might also consider its desirability, in relation to society in general as well as in relation to chemists.

By practicing his trade a bricklayer does not increase the volume of work for bricklayers. On the other hand, a competent chemist can think up far more projects than he can possibly carry out. Therefore, he needs more chemists to help him. That helps all chemists; and most of them do work which promotes human welfare. We are now getting into the question of whether a program of restricting the supply of chemists is desirable for society in general; and we must remember that in the long run society will not permit any condition to exist which is contrary to its own interests.

One way of reducing the number of chemists might be beneficial, though it could hardly be called regulation. Many men who have completed prescribed curricula in colleges and universities probably never should have entered the field of chemistry. We must find a way to insure that men who undertake to use scientific training are mentally and temperamentally capable of utilizing their knowledge, to the benefit of themselves and of society as a whole. When this has been accomplished, our actions and results will speak for us and we may reasonably expect renumeration in accordance with our contributions.

I must confess that I do not know the best way of accomplishing this result. It might be possible to set up aptitude tests or some other measures to eliminate poor prospects at the end of collegiate training.

No doubt there are other programs which would insure a sound approach to the problem of higher standards, better recognition, and more money for chemists. Let us seek these methods which build soundly for the future and let us refrain from hastily advocating an impractical program of temporary benefit which must in the long run reflect discredit on chemists and retard the progress of science.

We Need More, Not Fewer, Chemists

Dr. Albert L. Elder
Corn Products Refining Company

I was surprised that anyone would consider the subject of this symposium as an appropriate topic at this time. However, it appears that there are some people who continue to ask that freedom be restricted in spite of the innumerable limitations placed upon their methods of living during the past few years.

My years of teaching at various institutions have given me an opportunity to observe the results of attempts to limit the supply of people in colleges and universities. This has been particularly true in connection with both the legal and medical professions. The present shortage of qualified doctors and dentists is ample evidence that a policy of regulation for the sake of limitations is not in the public interest. Regulation does increase the probability of a livelihood in the profession where free competition has no opportunity to thrive. It is also the ideal seedbed for mediocrity. Of course, there are many in such professions under this system who strive to be successful and to do high quality work. My point is that a system of regulation is no assurance of uniform high quality work, but rather is positive assurance of a definite percentage of the opposite. Under a system of unlimited competition, the unqualified person is automatically forced out of the profession; obviously this is in the public interest.

We have witnessed great increases in the number of students registered in engineering and the sciences in in the United States during the past quarter of a century. Due to a policy of restricted production and bungling with the system of free enterprise, we have had one period during the 1930's when there was a temporary surplus of technical men; but, by the same definition, there was also a surplus of corn, and pigs, and automobiles and refrigerators.

Let us look at the present situation with respect to chemists and chemical engineers. The short-sighted government policy throughout the war has resulted in creating a great shortage of technically trained men in these fields at the present time. The report of Dr. Trytton at the Atlantic City meeting of the American Chemical Society indicated that it is improbable that a balance will occur for several years. He pointed out that industry is contemplating a great expansion of its resources in the near future. Industry realizes that research pays and that any company which does not have an aggressive research organization finds itself at the tail end of the procession. It appears that our government expects to spend many mil-

lions of dollars on research each year in the near future. It is obvious that this program could be organized so as to serve as a buffer in the employment situation. In times when industry cannot take up the slack, the government program could be expanded. In fact, it is clear that all political parties are committed to programs which tend to alleviate unemployment.

One of the most difficult problems confronting our nation today is that of labor. We have witnessed John L. Lewis state that over 400,000 Americans are employed under deplorable conditions. In fact many strikes are accompanied with clamors that working conditions are unsatisfactory. At the present time, we appear to be attempting to create a bigger pie by increasing the cost of the pie. The material goods of this nation represent the pie. We cannot obtain a bigger slice of the pie for ourselves, or at least everyone cannot obtain a bigger slice without increasing its size. Eventually, we must realize that to have more material goods the rate of production per man-hour must be increased. The only possible alternative to an unwillingness on the part of labor to expand its rate of production is to increase the efficiency of equipment used by industry. This can never be done with a restricted supply of technical manpower.

The highways of this nation constitute a national disgrace. Automobile transportation in cities is deplorable. Are we to believe that, by the proper application of research to this problem, we cannot build more stable highways, more economical highways, better systems of parking, cheaper and more lasting types of concrete and other paving materials?

Hundreds and thousands of veterans are clamoring for places in which to live. This is another national disgrace. Have we reached the Utopia with respect to building materials and efficiency in the construction of homes? If we have not, and I am sure that we have not, will we increase the probability of obtaining better building materials if we restrict potential research power?

This nation is faced with an expanding population and a gradual depletion of the productivity of the soil. If the people of this country are to have a sufficient supply of nutritious and palatable food, then a vast research program must be inaugurated. The price of fertilizers must be lowered, the efficiency of the soil must be maintained; new methods of harvesting, packing, and storing of foods are needed.

The world situation is equally gloomy. Millions of people throughout the world lack the bare necessities of food, clothing, and shelter. Without these, war is inevitable. It appears that some nations are making

an honest attempt to solve these problems on a world-wide basis. It is equally clear that others are not. If, on an ultimate analysis of the problem, it is shown that a system of free enterprise is not compatible with other forms of government, then some people believe that we will see the world divided into two basic systems of government. Each nation will be forced to cast its lot with one system or the other. It of course, follows that these two systems will war with each other. All are agreed that technological advances made during the past twenty-five years were of tremendous importance in winning this war. We came close to losing it because of insufficient reserve of technical manpower. The best guarantee I know of for losing the next war is the regulation of the supply of technical manpower.

It is my opinion that the American system of free enterprise and free competition has so much merit that every effort should be made to see that no stumbling blocks are put in the way of its progress. The cost of education of a technical person is far greater than that which he pays to the college or university. It is the duty of the institutions to emphasize to their incoming students the probability of obtaining employment upon graduation, the probable salaries which they will receive, and the significance of the work remaining to be done. Just as there are incompetents produced by systems of regulation, likewise there will be those under a system of free enterprise who are not qualified in spite of the degree which they have received. Some system of measuring the ability of the finished product which has been turned out by the colleges and universities is most desirable. Under a system of free enterprise, competition soon becomes a measure. There are some who believe that such further checks as licensing and/or registration are needed. At the present time, the A.C.S. is attempting to collect the mature judgment of the members of its organization with respect to the advantages of these further checks.

In conclusion, am I expected to accept a system of regulation for the sake of limitation which has been unsatisfactory in other professions? Am I expected to be in favor of inaugurating a system of regulation for curtailment of opportunity in a world faced with millions of hungry, naked, and homeless individuals? Am I expected to favor regulation when a shortage of technically trained men exists at the present time; when industry wants to expand the productivity of the nation; when our government is committed to a broader research program; when labor says that working conditions are deplorable; when shortages of many commodities still exist, and the pie is so small that all we can obtain is a crumb?

Avoid Regulation

Dr. V. I. Komarewsky
Illinois Institute of Technology

When a scientist or an engineer is confronted with a technical problem,, he proceeds with a careful study of the problem. He supplements this knowledge with a careful study of pertinent literature and with the performing of research work. Only then can he present his answer to the problem. When faced with a social, political, or economic problem, most of the people, scientists and engineers included, are apt to make rapid decisions based on purely sentimental likes or dislikes.

The writer, though not possessed of special knowledge of the problem under discussion, nor having made any careful literature studies, nevertheless has performed some rather extensive experimental research on the general topics of regulations, regimentations, and rationing. The results were most unsatisfactory in general.

Turning to the scheme of education of scientists and technologists in this country, the present speaker believes that the regulation of the supply of chemists in these times, when there is a large deficit of personnel in all lines of scientific and technical activities, is entirely out of the question.

We are always inclined to underestimate our technological advances. There is no doubt that in years to come we will face a disastrous shortage of scientific and technical personnel unless we induce our young men and women to enter the field of science and technology. This can be done only by free, American, democratic methods, avoiding all kinds of regulations, regimentation, or rationing.

Regulation Desirable

Dr. C. L. Thomas
Great Lakes Carbon Corporation

Most chemists are interested in their professional status and all chemists are concerned with their salaries. Considerable effort is made to improve the professional status and to raise chemists' salaries. As the professional status of chemists is improved and the salaries raised, it follows that more indivduals will be attracted to the profession. These additional members will include both the good and the marginal. It seems to me that the harder we try and the more we succeed in improving the lot of the chemists, the more of these individuals we will attract. It is my opinion that the number of marginal individuals attracted to the profession will exceed by far the number of good chemists. If this is the case, it would necessarily follow that these marginal individuals, as they get

into the ranks of the profession will lower the salaries of chemists. Actually we have witnessed a part of this phenomenon during the recent war when large numbers of "ninety day wonders" were trained and called themselves chemists.

As a result of these counter-balancing tendencies, it seems to me it follows that there is a definite limit to which the professional status of chemists can be raised, unless some steps are taken to regulate the supply of chemists and especially to regulate the supply of marginal chemists. It is my recommendation that the educational requirements should be re-examined periodically in connection with the supply of chemists.

At those times when the supply seems to exceed the demand, the educational requirements should be made more strenuous. This would have the effect of weeding out marginal material in times when the demand for chemists is lowest, and it would have the long term effect of raising the quality of men in the profession and presumably of improving the professional and economical status of chemists.

Robert P. Russell, president of Standard Oil Development Company, New York, has been awarded the Cadman Memorial Medal of the Institute of Petroleum, London. The presentation will be made on June 4th in the Lecture Hall of the Royal Institution, London.

International Congress Meeting

The 11th International Congress of Pure and Applied Chemistry will be held concurrently with the Centenary of the Foundation of the Chemical Society of London, in London, July 14 to 24, 1947. Information may be obtained from the Hon. Organizer, 11th International Congress of Pure and Applied Chemistry, 56 Victoria Street, London, S.W. 1, England.

Pacific Chemical Exposition

The first regularly scheduled Pacific Chemical Exposition, featuring an industrial chemical conference and display for the Western States and Pacific area, will be presented in the Civic Auditorium in San Francisco on October 21-25, 1947, by the California Section of the American Chemical Society. Chairman of the Exposition is Paul H. Williams of Shell Development Company. Members of THE AMERICAN INSTITUTE OF CHEMISTS on the advisory Board are: Willard H. Dow, Gustav Egloff, Paul D. V. Manning, Walter J. Murphy; Robert L. Taylor, and James G. Vail.

The Milan International Fair, scheduled for April 12-27th in Milan, Italy, has been postponed until September 12-27th. United States manufacturers are invited to exhibit their products at the fair, according to information received from John B. Erskine, No. 2251, 135 S. LaSalle St., Chicago, Illinois.

Robert J. Moore

Dr. Robert J. Moore, fifty-four, technical co-ordinator of Bakelite Corporation, unit of Union Carbide and Carbon Corporation, died January sixth, at his Montclair, New Jersey, home following a heart attack. An outstanding authority on the chemistry of modern plastics and active in professional and scientific societies for many years, Dr. Moore was a member of the National Research Council since 1944, under which he served on the Advisory Committee on plastics and coatings to the Quartermaster Corps. During the late war, he also served as consultant of the Referee Board, O.P.R.D. of the War Production Board, and on the Coatings Advisory Board of the Ordnance Department.

Since 1932, he has been chairman of the Technical Committee of the New York Paint and Varnish Production Club. In 1938, he was elected an honorary member of the Chemical Mining and Metallurgical Society of South Africa. He was a member of the New York Academy of Science, the American Institute of Chemical Engineers, and past president of THE AMERICAN INSTITUTE OF CHEMISTS. A fellow of The American Association for the Advancement of Science, Dr. Moore was former chairman of the American Section of the Society of Chemical Industry, and he remained American representative of the Plastics Group (London), until his death.

Formerly on the faculty of chemistry of Columbia University, Dr. Moore was chief chemist of Pratt and Lambert, Inc., varnish manufacturers, Buffalo, from 1924 to 1931. Since 1931, he was with the Bakelite Corporation as manager of the Development Laboratories, Bloomfield, New Jersey, until his appointment as technical co-ordinator in New York City.

A member of the Phi Lambda Upsilon and Alpha Chi Sigma fraternities, Dr. Moore maintained his interest in education through his activities as trustee of Polytechnic Intitute of Brooklyn, and as a member of the Plastics Advisory Council of Princeton University, and he addressed numerous audiences of chemists and of the general public upon the importance of their co-operation.

Many papers by Dr. Moore have appeared in scientific and other publications, among them an address entitled, "Endless Fields for Synthetics", read before the *Herald Tribune* Forum, November 22, 1942.

Dr. Moore was elected a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS on March 10, 1923; he was its vice-president in 1936-1938, and its president in 1938-1940. During his twenty-three years of membership, he took a leading position in its activities, was chairman of its

most important committees, and suggested and advocated the adoption of many methods for obtaining its objectives in increasing the acknowledgment of the importance of chemists to themselves and to the general public; and his deep interest in their welfare has been a major force in their professional and economic advancement.

He was always approachable and attentive to those who came to him for advice, and his suggestions have lifted many young chemists from despair and discontent to hopefulness and a determination to help themselves.

He appreciated that the success of chemistry as a science and as a help to mankind is more dependent upon the work of the chemist than upon commercial consideration, and he was ever endeavoring to martial and combine these two elements into a mutual force for the happiness and success of the human race.

As a conferee, he could not be hurried, his steps were slow and sure over a well-considered path upon solid ground, and he was always willing to forego his personal interests, if by so doing, it would advance the interests of others. Those who had the pleasure of conferring with him have always acknowledged the soundness of his theories and the justice of his conclusions.

Quiet, kindly, and sincere, one cannot recall him without quoting the lines of the Bard of Avon:

"His life was gentle, and the elements
So mix'd in him that nature might stand up,
And say to all the world, This was a man!"

In the passing of Dr. Moore, THE AMERICAN INSTITUTE OF CHEMISTS, chemists, the science of chemistry, its vast commercialization, and those who have known him, have lost a true friend, and the memory of him will lead to a still greater appreciation of his worth.

—Howard S. Neiman,
Honorary Secretary, A.I.C.

Brown Instrument Company, Philadelphia, Pennsylvania, has added forty-five new sales and service engineers to the field staff. These will be assigned to various regional offices and branches throughout the country. They are now attending the Brown Company School of Instrumentation.

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Johan Bjorksten PH.D.
CHEMISTS

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Dr. Ashley Robey, F.A.I.C., acting head of the Chemistry Department at Roanoke College, Salem, Virginia, reports that there is a fifty per cent student increase this year over any other year in its history, but that the college is able to care for this increase, and will be able to accommodate the expected increase of upperclass chemistry students in the next four years.

Production started in January at the Goodyear Tire and Rubber Company's new tire and mechanical goods plant in Uitenhage, South Africa. The factory will employ 500 persons, and production will be geared to the South African market. V. L. Follor is general superintendent.

L. H. Flett, F.A.I.C., spoke before the meeting of the National Association of Insecticide and Disinfectant Manufacturers, New York, N. Y., December 2nd, on "Alkyl Aryl Sulfonates Derived from Petroleum".

Chemist Available

Plant Manager, Ch. E., F.A.I.C. Presently employed as production manager and engineer in dehydrated food packaging plant. Company is moving where I can't follow, so I am seeking new, permanent connection. I have 17 years industrial experience in food, cosmetics, electrochemicals, color and allied lines in production, development, and research. Interviews solicited. Please reply to Box 20, THE CHEMIST.

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December Minutes

The 232nd meeting of the National Council of The American Institute of Chemists was held December 17th, at The Chemists' Club, New York, N. Y., with Dr. Foster D. Snell, president, presiding. The following officers and councilors were present: S. R. Brinkley, G. Egloff, L. H. Flett, J. Mattiello, J. M. McIlvain, D. Price, H. E. Riley, N. A. Shepard, F. D. Snell, W. D. Turner, and L. Van Doren. Dr. R. J. Moore and Miss V. F. Kimball were present.

The minutes of the Council meeting held on November 7th were accepted. Because of the unavoidable

absence of the Treasurer, no treasurer's report was presented.

The chairman of the Committee on Ethics presented committee findings and was asked to report at the next meeting of the Council concerning additional information to be obtained.

Dr. Robert J. Moore reported for the Jury on Medal Award that Dr. M. L. Crossley had been unanimously selected to receive the Gold Medal of the Institute for 1947.

The date of the Annual Meeting was set for Friday, May second, at the Hotel Commodore, New York, N. Y.

The proposed coalition between The American Institute of Chemists and the American Chemical Society was discussed. It was agreed that plans covering this coalition were now definite enough to be brought to the consideration of the members of both societies. The release date of January 6th was set for the mailing of a letter and ballot to each member of the Institute, asking for comments, so that the members' wishes could be determined for the guidance of the Council.

Upon motion, the following new members were elected:

Fellows

Barth, Edwin J.

Asphalt Technologist and Research chemist, Wood River Oil and Refining Company, Hartford, Illinois.

Beach, George Winchester

Technical Director, Libby, McNeill & Libby, Blue Island, Illinois.

Donlan, Theodore R.

Foreign Marketing Coordinator, Solvents Specialist, Standard Oil Company of New Jersey, Rockefeller Center, New York, N. Y.

Lampert, Lincoln M.

Assistant Director for Research, State Department of Agriculture (Senior Dairy Chemist) Sacramento, Calif.

Langsam, Nathaniel

Owner, Alpha Medical Laboratory, Brooklyn, N. Y.

Magoffin, James Edward

Chemical and Market Development Coordinator, Tennessee Eastman Corporation, Kingsport, Tenn.

Members

Dodge, Nickoles L.

Technical Representative, Glyco Products Co., Inc., Brooklyn, N. Y.

Lang, Martin

Chemist, Board of Water Supply, New York, N. Y.;
Instructor, General & Analytical Chemistry, Long Island University.

Mahar, Lyle J.

Chief Chemist, Coke Oven Laboratory, Bethlehem Steel, Lackawanna, New York.

Associate

Benjamin, Arnold
Chemist, The Pantasote Company, Passaic, N. J.

Raised from Members to Fellows

Fink, Albert Otto
Research Engineer, Chemical Developments Corp., Dayton, Ohio.

Goepfert, Werner
Research Chemist, Interchemical Corp., New York, N. Y.

Raised from Associates to Members

Saffitz, Abraham A.
Research Chemist, Picatinny Arsenal, Dover, N. J.

Stern, Edward
Patent Examiner, U. S. Patent Office, Washington, D. C.

There being no further business, adjournment was taken.

CHAPTERS

Louisiana

Chairman, J. David Reid *Vice-chairman,* William H. King
Secretary-treasurer, H. A. Schuyten
Pittsburgh Testing Laboratory
816 Howard Avenue, New Orleans, Louisiana
Council Representative, Harold A. Levey
Reporter to THE CHEMIST, Helen Robinson

The Louisiana Chapter met at Arnaud's Restaurant, New Orleans, La., December fourth. The members enjoyed an excellent dinner and then turned to the business of the evening. The officers shown above were elected. The subject of discussion was " The Role of THE AMERICAN INSTITUTE OF CHEMISTS in the Future Professional and Economic Status of Chemists". Colonel Harry P. Newton acted as Moderator and led the round table discussion, which concerned the need of recognition, from a social and economic angle, of the chemist as a professional man; the methods by which this may be accomplished, and the role that may be played by both the INSTITUTE and the American Chemical Society.

It was pointed out that the "self-termed chemist" is detrimental to the chemist as a class. However, there is no law to stop a man who has only a smattering of chemistry from calling himself an analytical chemist, or, as has lately happened, advertising the sale of certain nostrums. A legal definition of "chemist" backed by some sort of licensing procedure would help to eliminate such self-termed chemists.

The relative merits of state licensing as opposed to national cer-

tification were debated at some length. The following statement was made with regard to the A.I.C. and the A.C.S.: "With the extent of the interest exhibited in certification and/or licensing of chemists, it seems certain laws for such purposes will be passed in time by many states. It should be evident that when such enactments are made, a uniformity of laws should be encouraged to permit the free movement of chemists from one state to another for employment. The A.I.C. is the logical organization to consider the certification or licensing of chemists, as it is a professional organization and its classification of members is, in a sense, certification. The A.C.S., on the other hand, is basically a scientific literary society without provisions for the professional aspects of chemists provided for in its constitution. A close cooperation in interests should be developed between the two societies in the consideration of the professionalization of chemists. It could begin with the officers of the A.C.S. all becoming members of the A.I.C. As members of both societies, we appreciate and respect the contribution of the A.C.S. to chemists, the science of chemistry, and to the nation. Many of us fear that its future position, activities, and contributions would be endangered, should it go all-out for licensing laws. It would be well to advise all chemists of the aims of the two societies and those interested could be encouraged to join the A.I.C. and transfer their professional activity interests to this professional society."

After further discussion, the subject was summarized by Colonel Newton.

The newly-elected chairman, Dr. Reid, expressed his appreciation of his election, and then stated, "With regard to this evening's discussion, I am in favor of licensing, which I believe is necessary to enable the chemist to take his place in the sun with the members of the other professions, but I have been sitting here wondering how to influence 130 million people to license me as a chemist. It seems logical to start at the bottom. There are probably not more than five-hundred chemists in this state, and of these the most active five per cent are perhaps members of this chapter. If we in this chapter of the A.I.C. can convince all the chemists in the state, perhaps through contact with them at A.C.S. meetings, that a licensing law is an advantage to them, it may follow that they can convince the state legislature. But chemists, as a class, distrust licensing. It is probably better to first consider the licensing of those chemists engaged in work which has to do with public safety. This has public appeal. The public has already been educated to understand the many benefits of the Pure Food and Drug laws, and it is probable

that they would agree that anyone who does such specific work for them should be licensed and that undertrained, self-termed "Chemists" should not be allowed to engage in work having to do with public welfare. So if this section of the A.I.C. should school themselves in the details of the proposed Ohio law, for example, and then were to endeavor to convince about ten chemists apiece that such a law should be passed, we might get an entering wedge through the legislature which meets two years from now in this state. Once the legal definition of a chemist and licensing had been set up for chemists having to do with public welfare, it would probably be a comparatively simple matter to have it extended to cover those chemists to whom it would be advantageous."

The chairman then made the following appointments: Reporter to THE CHEMIST, Miss Helen Robinson; Chairman of the Committee on Public Relations and Legislation, Mr. W. H. King, with the assistance of Colonel H. P. Newton and Mr. T. H. Hopper; Chairman of the Program Committee, Mr. Harold Levey.

For Your Library

HIGHER MATHEMATICS FOR STUDENTS OF CHEMISTRY AND PHYSICS (with reference to practical work), by J. W. Mellor, D.Sc., F.R.S. *Dover Publications*. New impression, 1946. $4.50.

This is an American reprinting of the 4th English edition of a well-known work. The 4th English edition, 1912, differs very little from the second edition of 1906, chiefly in the elimination of typographical errors. From the dates of the English editions, as well as from the text, it is evident that the contents are based largely on the classical mechanics of Newton, Maxwell, Rayleigh, and Gibbs, that is, before H. A. Lorentz's pioneering in relativity, Planck's introduction of discontinuities into radiation phenomena, and the ensuing revamping of the whole classical structure to conform to the experimental observations of Michelson, Morley, Rutherford, and others. Based on the classics of its time, the book has become a classic itself. It is replete with examples which are valuable as exercises and which reflect the growing pains of chemistry on its way toward exact science.

THEORETICAL CHEMISTRY. An Introduction to Quantum Mechanics, Statistical Mechanics, and Molecular Spectra for Chemists. By Samuel Glasstone. *D. Van Nostrand Co.*, New York. pp. 515 + viii. Price, $5.00.

As the boundaries between advanced chemistry and advanced physics become fainter and fainter, the

chemist who would keep abreast of his times must vie with the physicist in precision measurements and mathematical proficiency. Although quantum mechanics and the calculus of probabilities are physico-mathematical in origin, the book at hand was written by a chemist of wide experience to focus the attention of chemists on certain aspects bearing essentially on chemical problems, such as the quantum theory of valence, the concept of resonance in connection with structural organic chemistry, the electronic configuration of molecules, the calculation of thermodynamic functions from spectroscopic data, dissociation accompanying light absorption, and intermolecular forces.

Considerable space is devoted to the applications of statistical mechanics and thermodynamics to equilibrium constants, free energies, reaction rates, and other intrinsically chemical functions.

ADVANCES IN NUCLEAR AND THEORETICAL ORGANIC CHEMISTRY. Frontiers of Science, Volume III, Edited by R. E. Burk and Oliver Grummitt. *Interscience Publications,* Inc. New York. pp. 165 + viii. Price $3.50.

This book contains a series of lectures delivered by distinguished scientists in the field of chemistry and some of its closely related physical aspects, who served as "professors for a day" at Western Reserve University. These lectures contain authoritative resumés of highly specialized and timely subjects: *Isotopes in Biochemistry,* by Albert S. Keston, N.Y.U. College of Medicine (pinch-hitting for David Rittenberg of the College of Physicians and Surgeons, who delivered the lecture but was prevented by illness from writing it up for publication): *Isotopes in Catalytic Reactions at Surfaces,* by Hugh S. Taylor, Chairman of the Dept. of Chemistry, Princeton: *Techniques in Nuclear Physics,* by H. R. Crane, Univ. of Michigan: *Extension of the Resonance Theory to Organic Molecules,* by Leslie G. Brooker, Eastman Kodak Company: *The Hydrogen Bond and its Significance to Chemistry,* by W. H. Rodebush, Univ. of Illinois.

Theory is reviewed but briefly and the accent is on scope, significance and practical applications of some of the newer principles and methods in chemistry. This comment applies also to the next volume in the same series, which is entitled:

MAJOR INSTRUMENTS OF SCIENCE AND THEIR APPLICATIONS TO CHEMISTRY. Frontiers of Science, Volume IV, edited by Burk & Grummit. *Interscience Publications,* New York. pp 151 + viii. $3.50, and consists of: *Electron Diffraction and Examination of Surfaces,* by Lester H. Germer, Bell Telephone Laboratories: *Applications of Electron Microscope,* by L. Marton, Stanford University: *Applications of X-Ray Diffraction,* by Mau-

rice L. Huggins, Eastman Kodak Company: *Chemical Spectroscopy* and *Applications of Absorption Spectra to Chemical Problems,* by Wallace R. Brode, Ohio State University: *Applications of Infrared Spectrometer,* by R. Bowling Barnes, Stamford Research Laboratories, American Cyanamid Company.

The applications of wave phenomena to structural identification of molecules are covered basically by leading authorities in their respective fields, extending over wavelengths from 5 x 10^{-9} cm in electron diffraction methods up to 1 x 10^{-3} cm in infrared techniques. There is wealth of information in this small volume.

—E. E. Butterfield, F.A.I.C.

INTRODUCTION TO THE CHEMISTRY OF THE SILICONES. By Eugene G. Rochow, *John Wiley and Sons, Inc.* 1946. 137 pp. $2.75.

In 1937, Frederick Stanley Kipping, who, along with his co-workers, had discovered the reaction of Grignard reagents with silicon halides and published more than fifty classic papers on organo-silicon chemistry, remarked in his Bakerian Lecture:

"We have considered all the known types of organic derivatives and we see how few is their number in comparison with the purely organic compounds. Since the few which are known are very limited in their reactions, the prospect of any immediate and important advance in this section of chemistry does not seem very hopeful."

Yet, within a decade, interest in silicon compounds has grown tremendously and the word "silicone" is familiar not only to chemists, but to engineers, physicists, and industrial designers everywhere. The diversity of products already obtained and the promise of more to come has aroused in many a desire to learn more about this relatively undeveloped field of organo-silicon chemistry.

This admirable volume answers the demand for information by presenting in concise form most of the published knowledge in this field.

The first few chapters review the silanes and their derivatives in detail, in order to furnish an understanding of the fundamental chemistry of non-silicate silicon compounds. The later chapters discuss the commercially important silicon polymers, their chemical and physical properties, methods of preparation, and uses. There is a good discussion comparing the industrial Grignard and the Direct Methods of synthesis of organosilicons.

The volume concludes with a chapter on the analytical methods employed in silicon chemistry, a very useful glossary of scientific terminology employed in this new field, and a fairly complete index.

In short, this work, with its numerous references, amply fulfills its purpose as a "compact yet comprehensive survey" of this growing branch of organic chemistry.

—Leonard Spialter, A.I.C.

Attention, Chemists!

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—*Benjamin Franklin.*

A science-conscious Congress which is now processing legislation for higher salaries for scientific and technical personnel should realize that high salaries alone will not encourage capable men to take positions in government agencies. The feeling in some quarters seems to be that money alone will induce scientific and technological personnel to prefer government service to private industrial or educational positions. That is a false impression. Top-level scientists, who contributed immeasurably to scientific developments for the armed services during wartime, are now leaving these agencies, not solely for monetary reasons, but more because they will enjoy richer professional relationships with industrial and educational organizations.

—*Walter J. Murphy, F.A.I.C.*

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March 4, 1947
March 25, 1947
April 22, 1947
May (Annual Meeting)
June 17, 1947

Meeting Dates

FEB. 6th—Pennsylvania Chapter, A. I.C. Engineers' Club, 1317 Spruce Street, Philadelphia. Speaker Dr. Max Seaton, executive vice-president, Westvaco Chlorine Products Corporation. "Chemicals From the Sea."

FEB. 7th—Chicago Chapter, A.I.C. The Electric Club, 20 North Wacker Drive, Chicago, Ill. Speaker, Dr. H. E. Robinson, assistant director of research, Swift and Company. "Can Research Be Managed?" Make reservations with Mary Alexander, HArrison 9690.

MAR. 6th—Pennsylvania Chapter, A. I. C. Engineers' Club, 1317 Spruce Street, Philadelphia. Speaker, George C. Collins, manager, Marketing Research Department, Pennsylvania Salt Manufacturing Company. "Marketing Surveys."

MAR 21st—New York Chapter, A.I.C. 26th Floor, No. 2 Park Avenue, New York, N. Y. Speaker to be announced.

APR. 3rd—Pennsylvania Chapter, A. I.C. Engineers' Club, 1317 Spruce Street, Philadelphia. Speaker, J. C. Geniesse or C.H.Van Hartesveldt, Research and Development Department, Atlantic Refining Company. "Petroleum Fuels and Lubricants."

MAY 2nd—Annual Meeting, the American Institute of Chemists. Hotel Commodore, New York, N. Y. Medal award to Dr. M. L. Crossley, F.A.I.C.

MAY 9th—New York Chapter, A.I.C. 26th Floor, No. 2 Park Avenue, New York, N. Y. Speaker to be annuonced.

JUNE—Pennsylvania Chapter, A.I. C. Outing. (To be announced).

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—Charles F. Kettering, in Blueprints

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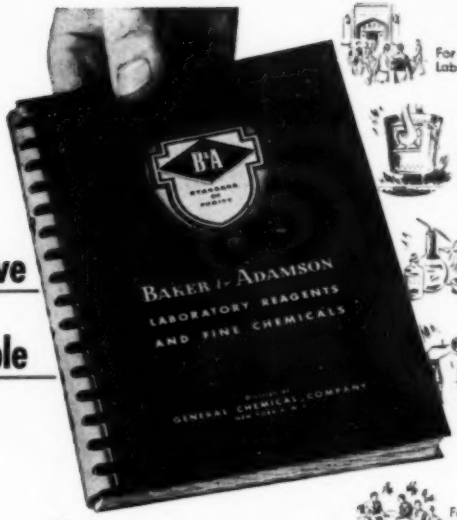

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